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ORGINAL ARTICLE/*ÖZGÜN MAKALE*

The Survey of Behavioral Systems in Relation to Test Anxiety: a Comparative Study

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Abstract

Aim: This study aimed to compare the behavioral activation systems between students with test anxiety (TA) and without TA.

Methods: This study included undergraduate students registered at the Medical Science University of during 2009-2010. The selected female students (N=300) completed Test Anxiety Scale (TAS) and Gray-Wilson personality questionnaire (GWPQ) and 100 students who have obtained the lowest and highest scores in TA questionnaire, were further compared according to Grays Brine-Behavioral questionnaire. Data were analyzed using a T-test.

Results: The results showed that samples were significantly different in total scores of Gray-Wilson personality questionnaire. In terms of subscales of Gray-Wilson personality questionnaire, there was a significant difference between the two groups in the behavioral inhabitation system (BIS) and fight -flight system (FFS) but no significant differences found between two groups in the behavioral activation system (BAS).

Conclusion: Test Anxiety was corresponded with brain systems behavior theory, and anxiety increased in the avoidance system activation. **(Journal of Cognitive Behavioral Psychotherapy and Research 2015; 3: 141-146)**

Keywords: Behavioral inhibition system, Behavioral activation system, Fight -flight system, Students

Özet

Sınav Kaygısıyla İlişkili Davranışsal Sistemler Konusunda Bir İnceleme: Bir Karşılaştırmalı Araştırma

Amaç: Bu çalışma sınav kaygısı olan ve olmayan öğrencilerin arasında davranışsal aktivasyon sistemlerini karşılaştırmayı amaçlamıştır.

Yöntem: Bu araştırma Tıbbi Bilimler Üniversite'sine 2009-2010 yıllarına kayıt olan öğrencilerden oluşmaktadır. Seçilen kadın öğrenciler (N= 300) Sınav Kaygısı Ölçeği'ni ve Gray-Wilson Kişilik Ölçeği'ni tamamladılar ve en düşük ve en yüksek sınav kaygısı puanına sahip 100 öğrenci daha sonra bu iki grup ölçek puanları bakımından karşılaştırılmıştır. Veriler T-test kullanılarak analiz edilmiştir.

Bulgular: Sonuçlar gösterdi ki grupların Gray-Wilson Kişilik Ölçeği'nden aldıkları toplam puanlar istatistiksel olarak anlamlı derecede farklıdır. Gray-Wilson Kişilik Ölçeği'nin alt-testlerinde iki grup, davranışsal inhibisyon sistemi ve kaç ya da savaş sistemi açısından istatistiksel olarak anlamlı fark gösterirken, iki grup arasında davranışsal aktivasyon sistemi açısından **anlamlı fark bulunmamıştır.**

Sonuç: Test Anksiyetesi beyin sistemleri davranış teorisine uyuyor gözükmektedir. Bekleneceği gibi kaçınma sisteminin aktivasyonuyla anksiyetenin artışı ilişkili bulunmuştur. **(Bilişsel Davranışçı Psikoterapi ve Araştırmalar Dergisi 2015; 3: 141-146)**

Anahtar Sözcükler: Davranışsal inhibisyon sistemi, Davranışsal aktivasyon sistemi, Kaç yada savaş sistemi, öğrenciler

INTRODUCTION

Test anxiety (TA) involves a combination of physiological over-arousal, worry and dread about test performance, and often interferes with learning and leads to decreased performance of student during the exam (Dadsetan 1997). It is a prevalent disorder among students in worldwide (Mandler, 1995). Various approaches exist in order to explanation of etiology of TA. For example Sarasun (1981) and Dadsetan (1997) introduced TA as a personality character, while Spilberger et al. (1980) stated the TA as part of trait anxiety. Overall researchers believed that development and severity of TA and related traits are more significant in relation to personality dimension (Hemmati 2010). Some theories such as Ayzeng and Gary's theory developed in order to explain the association of personality and potential of individuals for psychological disease such as anxiety (Matthews and Gilliland 1999). Gray (1999) represented a biological pattern, which indicates three behavioral systems. These systems includes behavioral inhibition system (BIS), behavioral activation system (BAS) and fight and flight system (FFS) (Peter et al. 2000) In this approach, the behavioral system including BIS, FFS and BAS are the cause of personality differences in different individuals (Gray 1994). The BAS is activated by conditioned and unconditioned signals of reward or relief from punishment, and it mediates the approach of behavior (Gray 2000). The FFS is activated by unconditioned, innate, and conditioned aversive signals (Aubi 2011). The BIS refers to inhibition or interruption of the behavior, and it is activated when conflicting goals are presented which leads to release of anxiety related response (Corr 2002a, Corr 2004b, Gray 1970). Thus, high-BIS (anxious) subjects would preferentially experience negative effects (Gray 1987). Gray and Johnson et al. also affirmed that anxiety is a result of high activation of BIS (Johnson et.al.2003). Some other studies also conducted to examine their theory about anxiety and most of them believed that research on Gray's model of personality has been hindered by the lack of specific self-report measures of activity and responsively of these systems (Nathan et al. 2012a). In a recent study, Maack et al. (2012) investigated the contribution of BIS sensitivity in relation to generalized anxiety disorder, Axis I disorders (e.g., major depression, other anxiety disorders) and cognitive-emotional vulnerabilities (e.g. anxiety sensitivity, emotion deregulation). The BIS found to be associated with GAD among 91 samples and BIS sensitivity emerged as a significant predictor of current GAD status beyond major depression, anxiety disorder diagnoses, anxiety sensitivity, emotion deregulation (Berghorst et al. 2013). Berghorst et al. (2013) reported that stress might promote the onset of psychopathology by disrupting reward processing. However, the extent to which stress impairs reward processing, rather than incentive processing more generally, is unclear. Their findings provide preliminary evidence that stress-reactive individuals show diminished sensitivity to reward, but not punishment, under stress. More recently, Levita et al. (2014) examined the relationship between individual differences in BIS and hippocampal structure. They selected 30 right-handed participants with no history of alcohol or drug abuse, neurological or psychiatric disorders, or traumatic brain injury (16 male) female range of 18-32 years. They concluded that hippocampal volume is related to the cognitive and affective dimensions of anxiety indexed by the sensitivity to punishment, and it supports the idea that morphological differences in the hippocampal formation may be associated with BIS contributions to anxiety. Beside, higher BIS and lower BAS were found to have significant indirect effects on social anxiety (Nathan et.al. 2010b). To the best of researchers' knowledge no study conducted to examine the relationship of BIS and BAS with TA. Therefore, present study was conducted to compare the situation of behavioral systems in two groups of students with high and low TA.

METHODS

Sampling

A causal comparative design was employed in this study. The study included all female undergraduate students attending to Islamic Azad Medical Science University of Mazandarn in three disciplines of health, nursing, and gynecology during 2009-2010. The students (N=300) selected through purposive sampling methods according inclusion/exclusion criteria, and completed the standard tools.

Inclusion criteria considered as being female, age group of 18-29, undergraduate students, students at medical college in nursing, health and gynecology disciplines, unmarried. The students who had trauma experience in last six months, failed in exams and had history of psychotherapy were excluded.

Procedure

Participants were given written instructions which included a brief rationale and procedure of the research. Then, they were asked to complete demographic information, test anxiety inventory (TAI) and Gray-

Wilson personality questionnaire (GWPQ). Out of 300 students 100 person who has obtained the lowest (N=50) and the highest (N=50) scores in the TAI administered in two groups as with TA (N= 50) and without TA (N= 50). Then, in order to find out difference of behavioral systems of two groups, they compared according the scores obtained in GWPQ.

Tools

Test Anxiety: TAI is a self-report scale which was designed by Spiellberger (1980) to measure individual differences in TA. TAI consists of 20 items that ask respondents to indicate how they feel in test situations. In this scale, the responses are based on their TA feeling and experiences. Respondents choose one of the four points: never (0), sometime (2), often (3), always (4). TAI included two subscales which are worry and emotionality. The reliability of this inventory assessed in Iran and Cronbachs α value was 0.92 in groups of girls and boys (Abolghasemi and Narimani 2005).

Gray-Wilson Personality Questionnaire (GWPQ): GWPQ evaluates the rate of cerebral/behavioral systems activities and their components. It is designed by Wilson, Barrett and Gray and it includes 120 items. Each item includes 20 elements for reducing the probability of agreeable responses bias and each one of approximately 10 data of the elements are being corresponded with 10 logical inverse elements. In terms of validity of this questionnaire Wilson et al. (1989) obtained appropriate Cronbachs α coefficient for the elements. Fallah, et al. (2000) translated this questionnaire to Persian language and reported Cronbachs α coefficient 0.66, 0.65 and 0.69 for the elements of BIS, BAS, and FFS, respectively (Ashrafi 2005).

Statistics

Descriptive statistics run for all data to obtain means, standard deviations, frequencies and percentages. T-Test was used to compare difference of scores of two groups with TA (N= 50) and without TA (N= 50) in order to find out difference of behavioral systems of groups.

RESULTS

Descriptive Results

All subjects of study were undergraduate students in the three disciplines of health, nursing and gynecology. The age range of participants was 18-29 (mean age 20.9 with 2.1 SD). A total number of 94 (94%) students were in 3rd to 8th semesters and only 4% of them were in semester 1-2, and rest was in last semester.

The mean TAI score, measuring total test anxiety of students was 44.2 ± 11.50. The mean of emotionality subscale was 19.4±9.9 and mean of worry subscale was 17.1± 10.2. In order to identify the percentage of students falling in high, moderate and low degree of TA (Female =100); cut-off ranges for high, moderate and low levels were derived by applying the formulae i.e., (Mean +/_S.D/2). The scores of (Mean +S.D/2) and above formed the range for high level, scores of (Mean _S.D/2) and below formed the range for low level, and scores between (Mean +/_ S.D/2) formed the range for moderate level on the above mentioned study variables. In order to identify the percentage of NSCLBP patients falling on all variables was computed as shown in subsequent section.

As is evident from Figure 1, large portion of the pie of TA i.e., (40%) comprised of students with moderate level of TA followed by (37.7%), low level of TA and the least i.e., is 23.3% comprised by students with high level of TA.

Comparative Results

There was no significant difference in terms of BAS of normal students group and group with test anxiety, 26.60 and 26.61 (SD= 5.2 and 2.7), respectively. This indicates that the BAS scores of students who were in TA group and normal group were not different (p

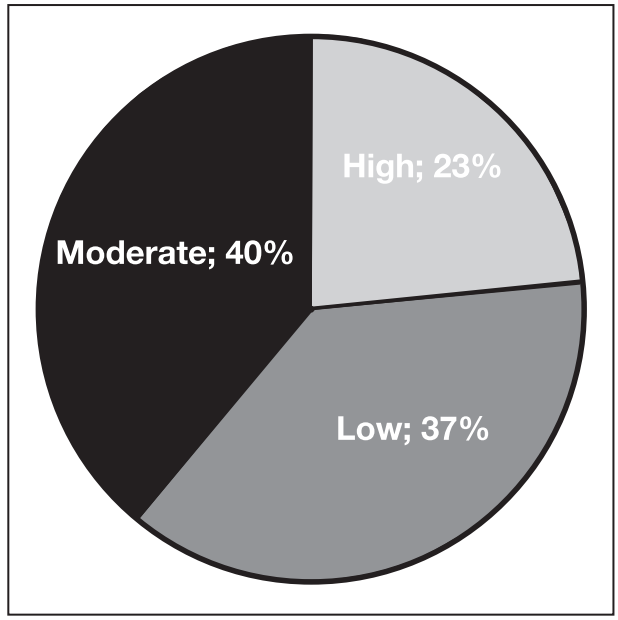

Figure 1. Distribution of TA Scores among initial sample (N=300)

>0.005) (Table 1). Although, the groups were different in terms of FFS and BIS (Table 1), the mean of two group in BIS was 30.02 (SD= 6.2) and 34.46 (SD= 3.05) for normal and TA group, respectively. The BIS of group with TA was higher than the BIS of normal group. In FF group also obvious significant differences ($p < 0.005$) for two normal (M= 33.76, SD= 3) and TA (M= 28, SD= 6.4) group was noted.

The groups are significantly different in BIS and FF ($p < 0.005$). The mean (M= 2.60, M= 26.61) and SD (5.2, 2.7) for group with high TA and low TA was different very slightly in two groups and the difference was not significant.

Table 1. Differences of behavioral brain systems in students with test anxiety and normal group

P**	T*	SD	Mean	Groups	Subscales
0.23	-.020	5.2	26.60	Without TA	**BAS**
	-.020	2.7	26.61	TA	
0.000	-.4.41	6.2	30.02*	Without TA	**BIS**
	-.4.5	3.05	34.46*	TA	
0.001	-5.6	3.0	33.76*	Without TA	**FFS**
	-5.5	6.4	28.00*	TA	

T*=T ratio
P**= the mean difference level

DISCUSSION

Feeling anxious at examination time is very common among students. Some students experience some level of stress when anticipating or taking an examination. A little nervousness is observed to help motivate the students; however, if the stress is too intense, it can affect the concentration during performance of the examination (Johnson 2000).

These results of this study demonstrated that students of Medicine College experienced different levels of TA. The majority of students (40%) experienced moderate level of TA and about 23% reported high anxiety level while rest had low level of TA. In harmony with our findings, Moghimian et al. (2011) reported that 27.3% of the nursing students had low anxiety, 38.2% had moderate anxiety, and 20% had severe anxiety. However, Cheraghian et al. (2008) reported that 14% of nursing students did not have test anxiety and 48.7% of them reported only low-test anxiety. This difference can be due to different reasons such as high pressure on students of Iran, no financial aid or cultural difference.

The present research was aimed to investigate the probable relationship between behavioral systems (BAS, BIS, and FFS) with TA. The results of independent T-test revealed groups with higher TA are higher in BIS and lower in FFS. These results are in harmony with theory of Gray, which stated anxiety is related to sensitivity of BIS. Since in Gray's theory, BAS and BIS are considered as typical physiological neurological systems, it is expected that activation of each one of these systems, accompany changes in physiological and psychological responses (Gray 1994). In fact, our study has shown the higher anxiety leads to more activities BIS, which is similar to findings of Heponiemi et al. (2003) and Fowles (2000). In view of Fuentes et al. (2012) also individual differences in anxiety-related personality traits are associated with level of BIS in different persons.

In fact, Gray's theory explains our findings by stating that BIS in which reactivity emerges as trait anxiety at the surface personality level (Gray 1987), leads to passive reactions and avoidance when confronted with punishment cues and new stimuli. As a result, the person becomes vulnerable to feeling pressure during performances such as test.

On the other hand, the BAS, activated by positive stimuli and signals of impending reward, activates the reward seeking behavior, feelings of pride and the expectancy for good events despite the existence of threat and danger (Gray 1987). These personality traits prevent the person from being distressed during exam which leads to lower TA.

Conclusion

The present research shows that BIS activity in the group with TA was higher than in-group with lower TA and in the group of normal students; BAS median was higher than in test anxiety TA group. According to the Gray's motivation theory (Gray 1994) behavioral inhibition system (BIS) is a neurological system, which is activated by disgusting stimuli clues (lack of reward, or punishment). The activation of this system causes inhibition and finally causes subjective experience of anxiety. Therefore, excessive sensitivity of behavioral inhibition system (BIS) can create an increase in anxiety state and inclination towards behavioral inhibition in an individual (Nathan 2010).

This study involved with some limitations such as small sample size and focusing on one university for selecting sample. Therefore it is not generalizable for all students with TA. Recommendations for future research are selecting a larger sample of subjects from different disciplines in different locations. It is also suggested that students be screened regarding mental health or life style before participating to study.

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